

BEFORE THE PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA

DOCKET NO. 2018-319-E

In the Matter of:)	
)	
Application of Duke Energy Carolinas, LLC)	DIRECT TESTIMONY OF
)	JAMES H. COWLING
For Adjustments in Electric Rate Schedules)	FOR DUKE ENERGY
and Tariffs)	CAROLINAS, LLC

I. INTRODUCTION AND SUMMARY

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is James H. Cowling, and my business address is 400 S. Tryon Street, Charlotte, North Carolina 28202.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by Duke Energy Business Services, LLC and I am the Director, Outdoor Lighting for Duke Energy Carolinas, LLC (“DE Carolinas” or the “Company”) and its affiliated utility operating companies.

Q. PLEASE SUMMARIZE YOUR EDUCATION AND PROFESSIONAL QUALIFICATIONS.

A. I received my Bachelor of Science degree in Electrical Engineering from Auburn University in 1986. I also received a Master of Business Administration degree from the University of Central Florida in 1999. I am a Professional Engineer licensed to work in the State of Florida and a Certified Energy Manager.

Q. PLEASE SUMMARIZE YOUR WORK EXPERIENCE.

A. I began working in the electric utility industry in 1981 as a co-op student with Alabama Power Company. One of my first roles was promoting and designing outdoor lighting installations. My primary work experience has been customer-facing, including roles in the areas of distribution engineering, major accounts, energy efficiency, load management, power quality, external relations, distribution operations, economic development, non-regulated services and sales, and outdoor lighting since 2012. I began as Manager,

1 Outdoor Lighting at Duke Energy Florida, Inc. in 2012 and was subsequently
2 promoted to Director, Outdoor Lighting for DE Carolinas and its affiliated
3 utility operating companies in September 2015.

4 **Q. PLEASE BRIEFLY DESCRIBE YOUR DUTIES AS DIRECTOR,**
5 **OUTDOOR LIGHTING.**

6 A. My primary responsibility is to oversee the strategic operation and direction of
7 the outdoor lighting business for Duke Energy and its affiliated utility
8 operating companies, including DE Carolinas.

9 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS**
10 **COMMISSION?**

11 A. No.

12 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

13 A. The purpose of my testimony is to describe DE Carolinas outdoor lighting
14 business to the extent that it impacts proposed rates. My testimony expands
15 upon Witness Michael J. Pirro's testimony regarding the rate design for the
16 Company's outdoor lighting products and services.

17 **Q. PLEASE DESCRIBE THE EXHIBITS ATTACHED TO YOUR**
18 **TESTIMONY.**

19 A. The exhibits to my testimony are as follows:

- 20 • Cowling Direct Exhibit 1 summarizes transition fees under existing
21 and proposed rates for mercury vapor ("MV"), metal halide ("MH"),
22 and high pressure sodium ("HPS") fixtures.

- 1 • Cowling Direct Exhibit 2 summarizes the net book value analysis as
2 of December 31, 2017 for MV, MH, and HPS fixtures, which serves
3 as the basis for the newly proposed transition fees.
- 4 • Cowling Direct Exhibit 3 displays the standard MV, MH, and/or HPS
5 to light emitting diode (“LED”) replacement fixtures for conversions.
- 6 • Cowling Direct Exhibit 4 summarizes the Greenwood County rates
7 being proposed for outdoor lighting service, which replaces obsolete
8 MV and incandescent technology with new LED fixtures.
- 9 • Cowling Direct Exhibit 5 summarizes all of the outdoor lighting
10 changes proposed in my testimony.

11 **Q. WERE COWLING DIRECT EXHIBITS 1 THROUH 5 PREPARED BY**
12 **YOU OR UNDER YOUR SUPERVISION?**

13 A. Yes.

14 **Q. PLEASE PROVIDE AN OVERVIEW OF THE COMPANY’S**
15 **OUTDOOR LIGHTING EFFORTS.**

16 A. Over the past five years, the outdoor lighting industry has experienced
17 tremendous change resulting from the advancement of LED technology.
18 Generally, LED outdoor lighting products are preferred by customers as they
19 offer significantly reduced energy use, exhibit longer lifetimes, do not contain
20 mercury, and provide a high color quality, which provides better illumination.
21 Thus, the industry is moving away from high intensity discharge (“HID”)
22 outdoor lighting products such as MV, HPS, and MH, and moving towards

LED technology.¹ In 2013, DE Carolinas began to formulate its Outdoor Lighting Modernization Plan (the “Plan”). The purpose of the Plan was to begin to adopt LED technology to offer newer, more efficient outdoor lighting systems to customers. In 2014, the Company began offering LED outdoor lights as a standard offering, which was approved by the Commission in PSCSC Docket No. 2014-214-E. In this same docket, the Company also received Commission approval to replace MV units upon failure for public (governmental) and private outdoor lighting customers.² Over the past few years, the Company has worked to address concerns regarding the net book value of the HPS and MH fixtures.³

Q. PLEASE PROVIDE A SUMMARY OF YOUR TESTIMONY.

A. My testimony recommends the following:

- The Company re-evaluated the outdoor lighting transition fees charged to customers who move from MH and HPS to LED. The Company proposes to lower the transition fees to balance the actual take-rates while protecting the rate class from pre-mature retirement of assets;
- The Company proposes to proactively replace MV lights with LED lights on Schedules PL (governmental lighting customers) and OL (private lighting customers). The Company proposes to begin proactive replacement in 2020 and complete by the end of 2023. This gives customers adequate time to budget for the conversions, and gives the

¹ U.S. Department of Energy, Energy Efficiency & Renewable Energy, *Adoption of Light-Emitting Diodes in Common Lighting Applications*, July 2015, Page 32

(http://energy.gov/sites/prod/files/2015/07/f24/led-adoption-report_2015.pdf).

² PSCSC Docket No. 2014-214-E, Order No. 2014-483, June 10, 2014.

³ PSCSC Docket No. 2015-422-E, Order No. 2016-93, February 10, 2016.

- 1 Company adequate time to complete the proactive replacements underway
2 in North Carolina;
- 3 • The Company proposes to close MV and incandescent outdoor lighting
4 products on Schedule SL, which serves Greenwood customers, due to
5 technology obsolescence;
 - 6 • The Company proposes to re-open Schedule PL and merge Schedule GL,
7 which also serves governmental lighting customers, into Schedule PL.
8 Schedule GL was created in 2010 prior to the wide-spread
9 commercialization of LED outdoor lights. Now that there are a growing
10 number of customers who likely want to upgrade to LED technology,
11 Schedule GL may create confusion and become a barrier to customers
12 voluntarily upgrading;
 - 13 • The Company proposes to close HPS fixtures to new installations to lessen
14 the impact on net book value, but will provide an option for customers
15 who want HPS fixtures for appearance matching;
 - 16 • The Company proposes to close Schedule NL, which is a pilot tariff
17 designed primarily to introduce LED technology, and to discontinue
18 Schedule FL and merge it into Schedules OL and PL; and
 - 19 • The Company proposes to implement minor revisions to the outdoor
20 lighting tariffs to improve tariff administration.

1 **II. OUTDOOR LIGHTING TRANSITION FEES**

2 **Q. EXPLAIN THE PURPOSE OF THE TRANSITION FEES ON THE**
3 **COMPANY'S OUTDOOR LIGHTING TARIFFS.**

4 A. In 2016, the Commission approved recovery of a transition fee for DE
5 Carolinas' customers who voluntarily chose to upgrade standard, decorative,
6 and/or floodlight outdoor lighting fixtures from MH or HPS to LED.⁴ The
7 purpose of the transition fee was to recover the remaining book value of the
8 MH and HPS lights being replaced to avoid adverse impacts on lighting rate
9 base. If customers transition from MH or HPS technology to LED technology
10 too rapidly, there would be a stranded net book value amount that all
11 customers in the rate class would eventually absorb. As of December 31,
12 2017, the Company has a net book value of \$79 million for approximately
13 348,000 outdoor lighting fixtures. Cowling Direct Exhibit 2 summarizes the
14 net book value of outdoor lighting fixtures in South Carolina as of December
15 31, 2017.

16 **Q. WERE THE TRANSITION FEES EFFECTIVE IN MINIMIZING THE**
17 **INCREASE IN RATE BASE CAUSED BY THE REPLACEMENT OF**
18 **LIGHTING ASSETS WITH LED TECHNOLOGY?**

19 A. Yes. Since the implementation of transition fees, the Company's records
20 indicate that DE Carolinas collected approximately \$28,700 and \$29,700 in
21 transition fees in 2016 and 2017, respectively, which equates to approximately
22 550 fixtures per year. The fees have successfully allowed customers to switch

⁴ PSCSC Docket No. 2015-422-E, Order No. 2016-93, February 10, 2016.

1 to LED technology while minimizing the impact of the transition on other
2 lighting customers.

3 **Q. IS DE CAROLINAS RECOMMENDING A CHANGE IN THE**
4 **TRANSITION FEES BASED UPON ITS EXPERIENCE?**

5 A. Yes. The fees were originally calculated using an assumption that 55 percent
6 of the existing fixtures would be replaced with LED technology within 20
7 years, with the remaining 45 percent being replaced within the remaining 16
8 years of depreciable life. Based upon the current transition experience to LED
9 technology, DE Carolinas now recommends that the transition fees are
10 calculated assuming 50 percent of the existing fixtures would be replaced with
11 LED technology within 20 years with the remaining 50 percent being replaced
12 within the remaining 20 years of depreciable life for area lights of Schedule
13 OL and for floodlights currently on Schedule FL. The Company is proposing
14 to keep the current 55 percent assumption for lights on Schedules GL and PL,
15 as the rates will reduce significantly under the current assumptions.

16 **Q. HOW DOES THIS REVISED ASSUMPTION IMPACT THE**
17 **PROPOSED TRANSITION FEES?**

18 A. Cowling Direct Exhibit 1 outlines the current and proposed transition fees on
19 Schedules OL, GL, PL, and FL. DE Carolinas proposes to reduce the fee to
20 transition from a standard MH or HPS fixture to an LED fixture from \$50 to
21 \$16 on Schedules GL and PL, and from \$64 to \$50 on Schedule OL. The
22 Company proposes to reduce the fee to transition from a standard MH
23 floodlight or HPS floodlight fixture to an LED and/or LED floodlight fixture

1 on Schedule FL from \$127 to \$109. Cowling Direct Exhibit 2 summarizes the
2 net book value analysis which was used to develop transition fee rates.

3 **Q. HOW IS THE TRANSITION FEE FOR NON-STANDARD AND**
4 **DECORATIVE FIXTURES DETERMINED?**

5 A. Due to the price variability of decorative or non-standard MH and HPS
6 fixtures, DE Carolinas proposes to continue to calculate a loss due to early
7 retirement fee (“LDER”) on a per luminaire basis as approved in PSCSC
8 Docket No. 2015-422-E.⁵

9 **Q. IS THERE A TRANSITION FEE TO CONVERT FROM MV TO LED?**

10 A. No. Industry data suggests that MV has reached obsolescence and the
11 Company believes that since no new MV fixtures have been installed since
12 January 2008 that early retirement will have a manageable impact on the
13 lighting class net book value.

14 **Q. FOR HPS FIXTURES THAT FAIL, IS THE COMPANY PROPOSING**
15 **TO WAIVE THE TRANSITION FEE?**

16 A. Yes. Upon complete fixture failure, the Company is proposing to waive the
17 transition fee and replace the failed HPS fixture with a comparable LED
18 fixture under the applicable monthly rate for the new fixture. This proposal is
19 similar to the way the Company waives the transition fee to replace failed MH
20 fixtures as approved by the Commission in PSCSC Docket No. 2017- 306-E
21 on October 11, 2017.

⁵ PSCSC Docket No. 2015-422-E, Order No. 2016-93, February 10, 2016.

1 **Q. HOW WILL THE COMPANY ADDRESS MINOR REPAIRS OF HPS**
2 **FIXTURES?**

3 A. The Company will continue to maintain HPS fixtures and perform minor
4 repairs.

5 **Q. WILL CUSTOMERS BE CHARGED A TRANSITION FEE FOR**
6 **VOLUNTARILY UPGRADING FROM HPS TO LED EVEN IF THE**
7 **HPS FIXTURE REQUIRES MINOR REPAIRS?**

8 A. Yes.

9 **Q. WILL CUSTOMERS BE CHARGED A TRANSITION FEE FOR HPS**
10 **FIXTURES THAT ARE UPGRADED TO LED DUE TO WILLFUL**
11 **DAMAGE?**

12 A. Yes. The transition fee is applicable to HPS fixtures that are replaced with
13 LED prematurely due to willful damage of the HPS fixture.

14 **Q. DOES THE COMPANY PROPOSE ANY NEW TRANSITION FEES?**

15 A. Yes. The Company believes that a transition fee is appropriate for all fixtures,
16 including LED to LED conversions, to minimize adverse impacts on the class'
17 net book value. Therefore, for customer requested changes, DE Carolinas
18 proposes a transition fee of \$40 per luminaire for LED to LED conversions.
19 This proposed transition fee would apply to LED facilities replaced at the
20 same location after the initial contract term has ended, provided the LED
21 facilities have been in service for less than 20 years. If the replaced LED
22 facilities have been in service for 20 years or longer, the Company will, at no
23 cost to the customer, change the fixture at the same location under a new

1 contract. This fee will protect the interest of the lighting class, while
2 allowing customer requests to change-out LEDs for either higher or lower
3 wattage LEDs and/or LEDs with warmer temperature settings resulting in
4 different color qualities.

5 **III. MERCURY VAPOR OBSOLESCENCE**

6 **Q. EXPLAIN THE COMPANY'S MV REPLACEMENT STRATEGY?**

7 A. Currently, DE Carolinas has received Commission approval to upgrade MV
8 fixtures to LED technology upon failure on Schedules PL and OL. There are
9 no MV outdoor lighting products on Schedules GL, FL or NL.

10 **Q. HOW MANY MV FIXTURES WERE REPLACED DUE TO FAILURE**
11 **IN 2016 AND 2017 IN SOUTH CAROLINA?**

12 A. The Company replaced 3,529 failed MV fixtures with LED fixtures in 2017
13 and 3,136 in 2016.

14 **Q. HOW MANY MV FIXTURES ARE REMAINING?**

15 A. As of December 31, 2017, the total number of MV fixtures remaining in the
16 field in South Carolina is approximately 76,700. On Schedule PL, there are
17 approximately 19,000 of MV fixtures and on Schedule OL, there are
18 approximately 57,700 MV fixtures that remain.

19 **Q. GIVEN THE CURRENT STRATEGY OF REPLACING MV FIXTURES**
20 **ONLY AT FAILURE, HOW LONG WILL IT TAKE TO UPGRADE ALL**
21 **DE CAROLINAS MV FIXTURES IN SOUTH CAROLINA?**

22 A. As mentioned in Section II above, customers may request to upgrade MV
23 fixtures to LEDs at any time without a transition fee. Assuming that

1 customers do not choose to upgrade voluntarily, the current failure rate is
2 approximately 4.4 percent per year (3,400 upgraded divided by 76,700 total
3 number of MV lights) or approximately 23 years. Lumen output for MV
4 fixtures begins to fade after six years. The Company's experienced-based
5 data suggests that the Company's MV fixtures are not being replaced when
6 the light output begins to diminish, therefore replacement at failure will take a
7 long time.

8 **Q. IS THE COMPANY REQUESTING TO UPGRADE MV FIXTURES**
9 **PROACTIVELY ON SCHEDULES PL AND OL?**

10 A. Yes. Given the otherwise potentially long glide path to replacement at failure
11 and the obsolescence of the technology, DE Carolinas is requesting to
12 proactively upgrade standard MV fixtures on Schedules PL and OL to LED
13 fixtures on Schedules PL and OL, respectively. A proactive strategy allows
14 the Company to more rapidly phase-out obsolete MV fixtures in South
15 Carolina. Also, it is more cost effective for the Company to replace the MV
16 lights proactively, grouping the work geographically rather than reactively
17 one-by-one as they fail.

18 **Q. IF APPROVED, WHEN DOES DE CAROLINAS PLAN TO BEGIN**
19 **PROACTIVE REPLACEMENT ON SCHEDULES PL AND OL?**

20 A. Though there are approximately 76,700 MV fixtures in total on Schedules PL
21 and OL, there is a significant rate difference when converting many of the MV
22 fixtures to LED fixtures for some customers. Based on the rates currently
23 approved on Schedules PL and OL, the estimated aggregate increase to

1 customers is approximately \$40,000 per month on Schedule PL and \$133,500
2 per month on Schedule OL. The Company is sensitive to the needs of its
3 customers and therefore proposes to begin proactive replacement in 2020.
4 This time frame gives customers a little more than three years to budget and
5 plan for the upgrade. Cowling Direct Exhibit 3 shows DE Carolinas' standard
6 MV to LED fixture conversion chart.

7 **Q. IF APPROVED, HOW LONG WILL THE PROACTIVE PROCESS**
8 **TAKE ON SCHEDULES PL AND OL?**

9 A. The Company believes that proactive replacement under Schedules PL and
10 OL can begin in 2020 and be completed by the end of 2023.

11 **Q. IF APPROVED, WHAT IS THE PROPOSED CONVERSION PROCESS**
12 **FOR CUSTOMERS ON SCHEDULES PL AND OL?**

13 A. If approved by the Commission, DE Carolinas will develop a conversion plan
14 by region, including a schedule. Prior to the start of any work, the Company
15 will send a letter to the impacted customers explaining the reasons for the
16 change and the conversion process. The Company will provide a dedicated
17 toll-free telephone number and an email address, so that impacted customers
18 can easily contact knowledgeable support staff who will be able to answer
19 questions including the billing impact.

20 **Q. IS THE COMPANY REQUESTING TO PROACTIVELY UPGRADE**
21 **DECORATIVE AND/OR NON-STANDARD MV FIXTURES?**

22 A. Yes. The Company estimates that there are approximately 210 post-top MV
23 fixtures on Schedule OL and 2 post-top MV fixtures on Schedule PL that will

1 need to be proactively replaced with available LED replacement options.

2 **IV. TECHNOLOGY OBSOLESCENCE ON SCHEDULE SL**
3 **(GREENWOOD)**

4 **Q. WHAT CHANGES ARE BEING PROPOSED RELATED TO**
5 **SCHEDULE SL?**

6 A. The Company is proposing to close the MV and incandescent outdoor lighting
7 products on Schedule SL and add new LED products to Schedule SL to
8 replace MV and incandescent fixtures at failure.

9 **Q. WHEN WAS SCHEDULE SL CREATED?**

10 A. Schedule SL was created on March 4, 1966 under an agreement between Duke
11 Power Company and Greenwood County Electric Power Commission Rural
12 Electric System ("Greenwood"), and only serves Greenwood customers.

13 **Q. DESCRIBE THE OUTDOOR LIGHTING PRODUCTS ON**
14 **SCHEDULE SL AND THE APPLICABLE RATES.**

15 A. As of December 31, 2017, Schedule SL contains three outdoor lighting
16 products and shared lighting accounts:

- 17 • 189 watt incandescent fixture at \$2.50 per month (8 lights)
- 18 • 7,000 lumen mercury vapor fixture at \$3.00 per month (300 lights)
- 19 • 20,000 lumen mercury vapor fixture at \$5.00 per month (5 lights)
- 20 • 463 shared lighting accounts (multiple customers pay for one or more
- 21 lights)

1 **Q. WHY IS THE COMPANY PROPOSING TO CLOSE THE OUTDOOR**
2 **LIGHTING PRODUCTS ON SL?**

3 A. Incandescent outdoor lighting technology has not been offered by the
4 Company for many years due to advances in technology and the desire of
5 customers to have more energy efficient outdoor lighting technology. For
6 MV, the Energy Policy Act of 2005 prohibits the manufacture and importation
7 of MV lamp ballasts after January 1, 2008.⁶ Since 2008, no new fixtures can
8 be sold with MV ballasts and no replacement ballasts can be purchased. This
9 presents a challenge to replace or repair damaged MV fixtures. Essentially,
10 due to technological advancements and/or the inability of the Company to
11 source replacement fixtures and parts, incandescent and MV outdoor lights
12 have reached obsolescence.

13 **Q. DOES THE COMPANY CURRENTLY OFFER INCANDESCENT AND/**
14 **OR MV FIXTURES ON ITS OTHER OUTDOOR LIGHTING**
15 **SCHEDULES (OL, GL, PL, FL AND/OR NL)?**

16 A. No.

17 **Q. HOW DOES THE COMPANY ADDRESS REPLACEMENT OF**
18 **FAILED INCANDESCENT AND/OR MV FIXTURES ON ITS OTHER**
19 **OUTDOOR LIGHTING SCHEDULES?**

20 The Company does not have incandescent outdoor lights on its other outdoor
21 lighting schedules. In 2007, in PSCSC Docket No. 2005-124-E, the Company
22 received Commission approval to close MV technology on outdoor lighting

⁶ Public Law 109-58 August 8, 2015, 42 USC § 15801.

Schedules OL and PL effective January 1, 2008.⁷ In 2014, in PSCSC Docket No. 2014-214-E, the Company received Commission approval to allow LED lights to be used as replacements upon failure of the MV lamp or the ballast, and for customers who voluntarily seek to replace MV lights with LED lights upon entering into an agreement with the Company on Schedules OL or PL.⁸

Q. IF APPROVED, HOW DOES THE COMPANY PLAN TO ADDRESS INCANDESCENT AND MV FIXTURES ON SCHEDULE SL WHEN THEY FAIL?

A. Upon failure, and if requested by the Customer, the Company will replace the failed incandescent and/or MV fixture with a comparable LED fixture upon entering into an agreement with the Company on Schedule SL, as applicable, at the Greenwood county rate for the energy consumption (kwh) plus the proposed fixture rate as summarized in Cowling Direct Exhibit 4.

Q. IF APPROVED, WHAT HAPPENS IF THE CUSTOMER DOES NOT ENTER INTO AN AGREEMENT WITH THE COMPANY TO UPGRADE TO LED AFTER THE EXISTING LIGHT FAILS?

A. Upon notice of the fixture failure, and if the Customer no longer wants lighting service from Duke Energy under Schedule SL, the Company will terminate billing of the existing fixture and remove the light fixture and the pole if it is a light-only pole.

⁷ PSCSC Docket No. 2005-124-E, Order No. 2007-620, September 7, 2007.

⁸ PSCSC Docket No. 2014-214-E, Order No. 2014-483, June 10, 2014.

1 **Q. CUSTOMERS ON SCHEDULE SL ALSO HAVE SHARED BILLING**
2 **TO SPLIT THE LIGHTING COSTS BETWEEN NEIGHBORS. IS**
3 **SHARED BILLING AN OPTION FOR THE NEW LED FIXTURES**
4 **ADDED TO SCHEDULE SL?**

5 A. Yes. The shared billing option is available for the new LED fixtures added to
6 Schedule SL to serve as replacements for existing Greenwood County fixtures
7 currently being served under Schedule SL. As incandescent and MV lights
8 fail and are replaced with LEDs, the Company will split the new billing
9 amounts under the same assumptions that exist for the light being replaced.

10 **Q. FOR THE LED LIGHTING FIXTURES, DOES THE COMPANY**
11 **BELIEVE ITS PROPOSAL CONSTITUTES A CHANGE IN**
12 **CONNECTION OR IN THE CHARACTER OF ITS OUTDOOR**
13 **LIGHTING SERVICE?**

14 A. Yes, the replacement of the fixture results in a change in the character of the
15 service. Greenwood County lighting customers currently utilize very old
16 technology. LED technology for outdoor lighting purposes has become the
17 new industry standard over the past five years. LED technology has many
18 characteristics such as color temperature, light output, and efficiency
19 standards that are very distinguishable from other light sources, including MV
20 and incandescent. For these reasons, installing new LED fixtures to replace
21 obsolete MV and incandescent technology results in a new product being
22 connected to the existing electrical wires, thus a change in the character of
23 service for the fixture.

1 **Q. IF GREENWOOD CUSTOMERS DO NOT UTILIZE DUKE ENERGY**
2 **AS THEIR REGULATED PROVIDER OF OUTDOOR LIGHTING**
3 **SERVICE, ARE THERE OTHER COMPANIES THAT PROVIDE**
4 **OUTDOOR LIGHTING SERVICES?**

5 A. Yes. There are other outdoor lighting service providers to choose from in
6 addition to DE Carolinas, so a Greenwood customer will have available
7 options.

8 **V. MERGE SCHEDULES GL AND PL**

9 **Q. WHY DOES THE COMPANY HAVE TWO PRIMARY RATE**
10 **SCHEDULES TO SERVE GOVERNMENTAL CUSTOMERS?**

11 A. In 2009, the Company received Commission approval to close Schedule PL,
12 effective February 1, 2010, and to create Schedule GL, effective February 1,
13 2010. However, Schedule PL was not terminated and it remains in effect for
14 continually effective agreements.⁹

15 **Q. WHY DID THE COMPANY CREATE SCHEDULE GL?**

16 A. In 2009, the Company created Schedule GL to capture capital costs for newer
17 fixtures, poles and underground services under a tiered approach.¹⁰ Schedule
18 PL reflected the average embedded costs for many very old fixtures, so
19 creating a tiered approach under Schedule PL for existing MV, HPS and MH
20 fixtures would have been very difficult at that time.

⁹ PSCSC Docket No. 2009-226-E, Order No. 2010-79, January 27, 2010.

¹⁰ PSCSC Docket No. 2009-226-E, Direct Testimony Jeffrey R. Bailey, page 16 lines 10 through 24, July 27, 2009.

1 **Q. IN THIS RATE PROCEEDING, WHAT CHANGES ARE BEING**
2 **PROPOSED WITH RESPECT TO MERGING SCHEDULES GL AND**
3 **PL?**

4 A. The Company is proposing to re-open Schedule PL, combine Schedule GL
5 and Schedule PL, and then close Schedule GL.

6 **Q. WHY DOES THE COMPANY NOW WANT TO CLOSE SCHEDULE**
7 **GL AND MERGE LIGHTS CURRENTLY ON SCHEDULE GL INTO**
8 **SCHEDULE PL?**

9 A. In 2009, the Company did not and could not have anticipated the rapid
10 advancement and adoption of LED technology for outdoor lighting
11 applications. If a current customer on Schedule PL wants to proactively
12 upgrade an existing HID fixture to LED, the new LED fixture would
13 transition to Schedule GL for billing purposes. The Company believes this
14 creates a barrier to LED adoption as customers are confused by the rate
15 differences between Schedules GL and PL. Therefore, customers do not want
16 to upgrade existing lights on Schedule PL to LED in fear of potentially
17 experiencing higher rates resulting from the pricing differences between the
18 two rate schedules.

19 **Q. IF APPROVED, WHAT RATES WILL BE APPLIED TO SCHEDULE**
20 **GL PRODUCTS MERGING INTO SCHEDULE PL UNDER THIS**
21 **PROPOSAL?**

22 A. If approved, lights on Schedule GL (existing pole, new pole, and new pole
23 served underground) will be moved to Schedule PL.

1 **Q. IF APPROVED, WHAT IMPACT DOES MERGING SCHEDULE GL**
2 **INTO SCHEDULE PL HAVE ON THE RATE OF RETURN ON**
3 **SCHEDULES GL AND PL?**

4 A. Witness Michael Pirro's direct testimony discusses the rate of return impact
5 this change will have on Schedules GL and PL, if approved.

6 **VI. OTHER PROPOSED CHANGES TO THE OUTDOOR LIGHTING**
7 **SCHEDULES**

8 **Q. EXPLAIN WHY THE COMPANY IS PROPOSING TO CLOSE HPS TO**
9 **NEW INSTALLATIONS.**

10 A. The industry continues to move away from HPS, MH and MV, and adopting
11 LED technology. LED outdoor lighting products are preferred by customers
12 as these types of lights offer significantly reduced energy use, exhibit longer
13 lifetimes, do not contain mercury and provide a high color quality which
14 provides better illumination.¹¹ By continuing to offer and add new HPS
15 fixtures to customers, the net book value of the lighting class is potentially
16 negatively impacted. The Company believes there are so many LED options
17 available now including lower color temperatures which are similar in
18 appearance to HPS, there is no need to continue to offer HPS fixtures.

¹¹ U.S. Department of Energy, Energy Efficiency & Renewable Energy, *Adoption of Light-Emitting Diodes in Common Lighting Applications*, July 2015, Page 32
(http://energy.gov/sites/prod/files/2015/07/f24/led-adoption-report_2015.pdf).

1 **Q. IS THE COMPANY WILLING TO INSTALL A HPS FIXTURE IF A**
2 **CUSTOMER DESIRES SUCH FIXTURE FOR APPEARANCE**
3 **MATCHING?**

4 A. Yes. Where the customer requests the continued use of the same HPS fixture
5 type for appearance reasons, the Company will attempt to provide such fixture
6 and the customer will be billed in accordance with the applicable provisions
7 on either Schedule PL or Schedule OL.

8 **Q. EXPLAIN WHY THE COMPANY IS PROPOSING TO CHANGE THE**
9 **CONTRACT TERM FOR STANDARD PRODUCTS ON SCHEDULE**
10 **OL.**

11 A. DE Carolinas is proposing to increase the contract term on Schedule OL for
12 standard products from one year to three years. The Company incurs a
13 significant capital investment when installing new outdoor lighting assets,
14 which have a very long depreciation period. A one-year contract term is
15 inadequate and has resulted in many inactive lights on the system. In the long
16 run, inactive lights drive up the cost of service for the entire rate class.

17 **Q. IS A CHANGE PROPOSED FOR SCHEDULE FL?**

18 A. Yes. To streamline tariff administration, the Company is also proposing to
19 move the floodlights on Schedule FL (and associated notations) to Schedules
20 OL and PL, thus completely removing Schedule FL. The Company believes
21 that removing Schedule FL will make it easier for customers to understand
22 their lighting options on Schedules OL and/or PL. The Company is proposing
23 to maintain the existing rate structure for floodlight service on Schedule FL

1 (existing pole, new pole, and new pole underground) when merged into
2 Schedules OL and/or PL. The merger of Schedules GL and PL will not impact
3 the rate design of floodlights that currently exists.

4 **Q. PLEASE EXPLAIN THE CHANGE REQUESTED FOR SCHEDULE**
5 **NL.**

6 A. Schedule NL is a Nonstandard Lighting Service Pilot tariff. The Company is
7 proposing is to close Schedule NL to new customers. This tariff was
8 introduced to allow the Company to offer LED fixtures for early adopters.
9 The Company believes Schedule NL should be closed now that LED fixtures
10 are standard.

11 **VII. CONCLUSION**

12 **Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?**

13 A. Yes.

Duke Energy Carolinas, LLC
PSCSC Docket No. 2018-319-E
Summary of Existing and Proposed Transition Fees

	(a)	(b)	(c)	(d)	(e)	(f)
	Existing Approved Transition Fees					
	Fixture Type	Product Type	Schedule OL	Schedule PL	Schedule GL	Schedule FL
1	Mercury Vapor	Standard	No Fee	No Fee	No Fee	Not Applicable
2	Mercury Vapor	Decorative / Non-Standard	No Fee	No Fee	No Fee	Not Applicable
3	Mercury Vapor	Floodlight	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4	Metal Halide (a)	Standard	\$64	\$50	\$50	Not Applicable
5	Metal Halide (a)	Decorative / Non-Standard	Loss Due to Early Retirement (b)	Loss Due to Early Retirement (b)	Loss Due to Early Retirement (b)	Not Applicable
6	Metal Halide (a)	Floodlight	Not Applicable	Not Applicable	Not Applicable	\$127
7	High Pressure Sodium	Standard	\$64	\$50	\$50	Not Applicable
8	High Pressure Sodium	Decorative / Non-Standard	Loss Due to Early Retirement (b)	Loss Due to Early Retirement (b)	Loss Due to Early Retirement (b)	Not Applicable
9	High Pressure Sodium	Floodlight	Not Applicable	Not Applicable	Not Applicable	\$127
	Proposed Transition Fees					
	Fixture Type	Product Type	Schedule OL	Schedule PL	Schedule GL	Schedule FL
10	Mercury Vapor	Standard	No Fee	No Fee	(c)	(d)
11	Mercury Vapor	Decorative / Non-Standard	No Fee	No Fee	(c)	(d)
12	Mercury Vapor	Floodlight	Not Applicable	Not Applicable	(c)	(d)
13	Metal Halide (a)	Standard	\$50	\$16	(c)	(d)
14	Metal Halide (a)	Decorative / Non-Standard	Loss Due to Early Retirement (b)	Loss Due to Early Retirement (b)	(c)	(d)
15	Metal Halide (a)	Floodlight	\$109	\$109	(c)	(d)
16	High Pressure Sodium (a)	Standard	\$50	\$16	(c)	(d)
17	High Pressure Sodium (a)	Decorative / Non-Standard	Loss Due to Early Retirement (b)	Loss Due to Early Retirement (b)	(c)	(d)
18	High Pressure Sodium (a)	Floodlight	\$109	Not Applicable	(c)	(d)

- (a) A transition fee applies for customer requested replacements only. If the fixture fails, the Company replaces the fixture with a comparable LED fixture at no charge to the customer.
- (b) Loss Due to Early Retirement ("LDER") is a calculation of the value lost when equipment is taken out of service (retired) before the end of its useful life. LDER is calculated by taking the original cost (including material and labor), less accumulated depreciation, less salvage of material removed, plus the cost of removal.
- (c) The Company is proposing to merge Schedule GL into Schedule PL and move associated notes and applicable fees.
- (d) The Company is proposing to remove Schedule FL and move associated notes and applicable fees to Schedules OL and PL.

Duke Energy Carolinas, LLC
PSCSC Docket No. 2018-319-E
Summary of the Net Book Value Analysis as of 12/31/2017

	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
	State + Fixture Type	Utility Acct (a)	State	Type of Fixture	Annual Depreciation Rate (b)	# of Light Fixtures (c)	Net Book Value @ 12/31/17 (d)	NBV per Fixture e = (g) / (f)	% of Fixtures Replaced over 20 Years (Take Rate %) (e)	Period For 100% Total Replacement (Years) (f)	Required Transition Charge (\$ per fixture) (g)	Prior Analysis Required Transition Charge (\$ per fixture) (h)
1	SC standard lights	371	SC	Standard	2.04%	203,952	33,234,022	\$ 163	50%	40	\$ 50	\$ 64
2	SC standard lights	373	SC	Standard	2.32%	55,962	8,417,808	\$ 150	55%	36	\$ 16	\$ 50
3	SC standard lights Total					259,914	41,651,830	\$ 160				
4	SC Flood lights	371	SC	Flood	2.04%	47,977	13,436,041	\$ 280	50%	40	\$ 109	\$ 127
5	SC Flood lights	373	SC	Flood	2.32%	-	-	\$ -	NA	NA		
6	SC Flood lights Total					47,977	13,436,041	\$ 280				
7	SC decorative lights*	371	SC	Decorative	2.04%	37,444	22,460,466	\$ 600	50%	40	\$ 305	\$ 344
8	SC decorative lights*	373	SC	Decorative	2.32%	2,996	1,426,768	\$ 476	50%	40	\$ 212	\$ 362
9	SC decorative lights Total					40,440	\$ 23,887,234	\$ 591				
10	Grand Total					348,331	\$ 78,975,105	\$ 227				

(a) The Company maintains its books and records in accordance with the FERC Uniform System of Accounts. FERC Account 371 is Installations on Customer's Premise, which includes private area lighting assets. FERC Account 373 is Streetlighting and Signal Systems which includes public street lighting assets.

(b) The annual depreciation was effective during the last depreciation study. For assets in FERC Account 371 the annual depreciation rate is 2.04% (49 years). For assets in FERC Account 373 the annual depreciation rate is 2.32% (43 years).

(c) The number of light fixtures reflect the quantities placed in-service in the PowerPlan Sub-ledger as of 12/31/2017.

(d) The net book value reflects the amount net of accumulated depreciation for mercury vapor, metal halide, and high pressure sodium fixtures placed in-service in the PowerPlan Sub-ledger as of 12/31/2017.

(e) The take rate percentage is the percentage of fixtures in Col. f that are assumed to be replaced within 20 years.

(f) The number of years is presumably the amount of time, given the assumed take rate in Col. i for 100% of the fixtures in Col. f to be fully depreciated.

(g) The required transition fee is the amount per fixture given the take rate percentage in Col. i and the annual depreciation rate in Col. e.

(h) The prior analysis is the required transition fee per fixture based on a take rate of 55%, which is the current Commission approved methodology for Standard and Flood Lights.

*The company uses a Loss Due to Early Retirement methodology to calculate the required transition charge for decorative fixtures

Duke Energy Carolinas, LLC
PSCSC Docket No. 2018-319-E
Standard Conversion Chart

	(a)	(b)	(c)	(d)	(e)	(f)
	Mercury Vapor			LED		
	Lumens	Wattage	Style	Lumens	Wattage	Style
1	4000 lumens	100 W	Suburban (Nema)	4500	50 W	Area
2	7500 lumens	175 W	Suburban (Nema)	4500	50 W	Area
3	7500 lumens	175 W	Urban (Cobra)	4500	50 W	Area
4	20000 lumens	400 W	Urban (Cobra)	12500	150 W	Area
5	55000 lumens	1000 W	Urban (Cobra)	18500	220 W	Area

	High Pressure Sodium			LED		
	Lumens	Wattage	Style	Lumens	Wattage	Style
6	9500 lumens	100 W	Suburban (Nema)	4500	50 W	Area
7	9500 lumens	100 W	Urban (Cobra)	4500	50 W	Area
8	16000 lumens	150 W	Urban (Cobra)	6500	70 W	Area
9	27500 lumens	250 W	Urban (Cobra)	12500	150 W	Area
10	50000 lumens	400 W	Urban (Cobra)	18500	220 W	Area

	Metal Halide			LED		
	Lumens	Wattage	Style	Lumens	Wattage	Style
11	9000 lumens	100 W	Urban (Cobra)	4500	50 W	Area
12	40000 lumens	400 W	Urban (Cobra)	18500	220 W	Area

Duke Energy Carolinas, LLC
PSCSC Docket No. 2018-319-E
Summary of Proposed LED Rates for Schedule SL (Greenwood County Rates)

	(a)	(b)	(c)	(d)	(e)	(f)
	Rate Summary					
	Current Installed Fixture Type	Current Rate Per Month	Proposed Replacement Fixture	Proposed Fixture Rate	Proposed kWh Rate	Total Proposed Month Rate = (d) + (e)
1	189 Watt Incandescent (~8 lights)	\$2.50	50 Watt LED	\$9.67	\$.01999 x 18 kWh = \$.36	\$10.03
2	7,000 lumen Mercury Vapor (~300 lights)	\$3.00	50 Watt LED	\$9.67	\$.01999 x 18 kWh = \$.36	\$10.03
3	20,000 Lumen Mercury Vapor (~5 lights)	\$5.00	150 Watt LED	\$13.51	\$.01999 x 54 kWh = \$1.08	\$14.59

Duke Energy Carolinas, LLC
PSCSC Docket No. 2018-319-E
Summary of Proposed Outdoor Lighting Proposed Changes

(a) Rate Schedule		(b) Proposed Change	(c) Reason
1	Schedule OL - Outdoor Lighting Service	Adding Floodlight products to tariff to discontinue Schedule FL.	To simplify tariff administration for customers and the Company.
2	Schedule OL - Outdoor Lighting Service	Increasing contract term from one year to three years for all standard fixtures and poles installed at a residence.	To standardize contract terms and to lessen the impact of early terminations to the lighting customer class.
3	Schedule OL - Outdoor Lighting Service	Lowering the standard transition fee from \$64 to \$50. Lowering the floodlight transition fee from \$127 to \$109.	Reduced fees based upon book value analysis as of 12/31/2017.
4	Schedule OL - Outdoor Lighting Service	Adding a new LED to LED transition fee of \$40 for LED change-outs.	To cover the O&M costs of changing out working LEDS for customers wishing to upgrade to a different type of LED light.
5	Schedule OL - Outdoor Lighting Service	Proactive Mercury Vapor replacement starting in 2020 and ending by the end of 2023.	To phase out obsolete light fixtures and to modernize the lighting system.
6	Schedule OL - Outdoor Lighting Service	Closing High Pressure Sodium technology.	LEDs are the new industry standard, however the Company will continue to repair HPS fixtures and add new ones for appearance matching.
7	Schedule FL - Floodlighting Service	Discontinuing Schedule FL and adding products to Schedules OL and PL.	To simplify tariff administration for customers and the Company.
8	Schedule NL - Nonstandard Lighting Pilot	Closing Schedule NL for new service.	The tariff was created as a pilot for LEDs. LEDs are now apart of the Company's standard offering.
9	Schedule PL - Street and Public Lighting Service	Re-opening tariff to merge GL and PL.	To create one rate schedule for governmental customers.
10	Schedule PL - Street and Public Lighting Service	Lowering the standard transition fee from \$50 to \$16. Lowering the floodlight transition fee from \$127 to \$109.	Reduced fees based upon book value analysis as of 12/31/2017.
11	Schedule PL - Street and Public Lighting Service	Adding Floodlight products to tariff to discontinue Schedule FL.	To simplify tariff administration for customers and the Company.
12	Schedule PL - Street and Public Lighting Service	Proactive Mercury Vapor replacement starting in 2020 and ending by the end of 2023.	To phase out obsolete light fixtures and to modernize the lighting system.
13	Schedule PL - Street and Public Lighting Service	Closing High Pressure Sodium technology.	LEDs are the new industry standard, however the Company will continue to repair HPS fixtures and add new ones for appearance matching.
14	Schedule GL - Governmental Lighting Service	Discontinuing Schedule GL and adding products to Schedule PL.	To simplify tariff administration for customers and the Company.
15	Schedule SL - Greenwood County Street Lights	Closing Mercury Vapor and Incandescent technology. Adding LEDs to replace older technology at failure.	To phase out obsolete light fixtures and to modernize the lighting system.